Republic of Kenya

☞ EDICT OF GOVERNMENT ☜

In order to promote public education and public safety, equal justice for all, a better informed citizenry, the rule of law, world trade and world peace, this legal document is hereby made available on a noncommercial basis, as it is the right of all humans to know and speak the laws that govern them.

KS 05-525 (2009) (English): Pasta products - Specification (Draft Standard)

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

DRAFT KENYA STANDARD

DKS 05-524: 2009
ICS 67.060

Pasta products - Specification

© KEBS 2009

Fourth Edition 2009

TECHNICAL COMMITTEE REPRESENTATION

The following organizations were represented on the Technical Committee:

National Cereals and Produce Board
Ministry of Health — Department of Public Health
— Division of Nutrition
Egerton University
Pembe Flour Mills Ltd.
Nestle Foods
Unga Ltd.
Cap[well Industries Ltd
Proctor and Allan (EA) Ltd.
Ministry of Trade and Industry — Department of Industry
Government Chemist's Department
Jambo Biscuits Ltd.
Consumer Information Network (CIN)
Kenyatta National Hospital
Kenya Bureau of Standards — Secretariat

REVISION OF KENYA STANDARDS

In order to keep abreast with the progress in the industry, Kenya standards shall be regularly reviewed. Suggestions for improvement of published standards are welcome and should be addressed to the Managing Director, Kenya Bureau of Standards.

© Kenya Bureau of Standards, 2009

Copyright. Users are reminded that by virtue of Section 25 of the Copyright Act, Cap. 12 of 2001 of the Laws of Kenya, copyright subsists in all Kenya Standards and except as provided under Section 26 of this Act, no Kenya Standard produced by Kenya Bureau of Standards may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from the Managing Director.

Pasta products - Specification

KENYA BUREAU OF STANDARDS (KEBS)

Head Office: P.O. Box 54974, Nairobi-00200, Tel.: (+254 020) 605490, 602350, Fax: (+254 020) 604031
E-Mail: info@kebs.org, Web:http://www.kebs.org

Coast Region
P.O. Box 99376, Mombasa-80100
Tel.: (+254 041) 229563, 230939/40
Fax: (+254 041) 229448

Lake Region
P.O. Box 2949, Kisumu-40100
Tel.: (+254 057) 23549, 22396
Fax: (+254 057) 21814

Rift Valley Region
P.O. Box 2138, Nakuru-20100
Tel.: (+254 051) 210553, 210555

Foreward

This Draft Kenya Standard has been revised by the Technical Committee on Processed Cereals and Pulses under the guidance of the Standards Project Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

Macaroni, Spaghetti, Vermicelli, etc. belong to a class of products generally known as pasta products. These products have gained fast popularity in catering and home use.

The manufacturing process for macaroni or spaghetti consists of dough preparation from durum wheat (hard wheat) and cold or lukewarm water, kneading process and extrusion through the extrusion press fitted with a die for the desired shape. The extruded products are cut to a given length and then dried to a definite moisture content under controlled temperature and humidity.

This revision aimed at updating various parameters in line with the best international practice.

During the preparation of this standard reference was made to the following documents:

IS 1485: Specification for macaroni, spaghetti and vermicelli.

Sri Lanka Standard 420: Specification for pasta products (macaroni, spaghetti, vermicelli and noodles).

The assistance received from the above documents is acknowledged with thanks.

Pasta products - Specification

1. Scope

This Kenya Standard prescribes the requirements and methods of test for pasta products.

2. Types

Pasta products covered in this standard shall be of the following types:

(*a*) Macaroni

(*b*) Spaghetti

(*c*) Vermicelli

(*d*) Noodles

(*e*) Short-cut pasta

(*f*) Lasagne

3. Requirements

3.1 **Basic Ingredients —** The dough for the manufacture of pasta products shall either be prepared from semolina derived from durum grains, hard wheat varieties or any combination of two or more of the specific wheat flours.

3.2 Description

3.2.1 *Macaroni* **—** It shall be in the form of tubes of a minimum length of 250 mm. Outer diameter of the tube shall range from 2.5 mm to 7 mm and the wall thickness shall be 1.0 mm with tolerance of ± 0.1 mm.

3.2.2 *Spaghetti* **—** It shall be in the form of solid rods of a minimum length of 250 mm and minimum diameter of 1.6 mm with tolerance of ± 0.1 mm.

3.2.3 *Vermicelli* **—** It shall be in the form of solid rods of minimum length 250 mm and of diameter between 0.5 mm to 1.25 mm.

3.2.4 *Folded Vermicelli* — They shall be in the form of folded rods of diameter between 0.5 mm to 1.25 mm.

3.2.5 *Noodles* — They shall be in the form of solid rods of minimum length 250 mm and diameter between 1.25 mm and 2.0 mm or ribbons of width from 1.5 mm to 15 mm and thickness ranging from 1.25 mm to 2.0 mm.

3.2.6 *Folded Noodles* — These shall be in the form of folded ribbons of thickness ranging from 1.25 mm to 2.0 mm.

3.2.7 *Short-cut Pasta* — These shall be products of various defined forms such as shells, stars, squares, etc.

3.2.8 *Lasagne* — These shall be square or rectangular shaped pasta products.

3.2.9 *Special Type Pasta* — These may contain eggs or vegetable products and the final products shall have the appearance of the characteristic added material such as yellow for egg pasta and green for spinach pasta.

3.2.10 *Egg Pasta* — The egg macaroni, egg spaghetti, egg noodles or egg alimentary pasta shall contain not less than 4 per cent egg yolk solids when tested according to the method in Appendix H.

The egg yolk solids shall be derived from whole egg, frozen egg yolk.

3.3 Other Physical Characteristics — Pasta products shall be smooth, translucent, hard brittle and up to a point elastic, and when broken the fracture shall appear glassy.

3.3.1 The products shall not contain any added colouring matter.

3.3.2 Pasta products shall retain their shapes and show no sign of disintegration and shall swell appreciably when plunged into vigorously boiling water and boiled in accordance with the time declared by the manufacturer for each variety of the products.

3.3.3 When cooked, pasta product shall retain its shape and a certain firmness and develop a clear characteristic odour of hard wheat and shall not become pasty.

3.4 Chemical Requirements

3.4.1 *Moisture Content* — Moisture content of macaroni, spaghetti, vermicelli, folded vermicelli noodles and folded noodles shall be not more than 13 per cent m/m when tested according to the method in Appendix A.

3.4.2 The moisture content for short-cut pasta shall be not more than 13 per cent m/m when tested according to the method in Appendix A.

3.4.3 Pasta products shall also comply with the compositional requirements given in Table 1.

TABLE 1. COMPOSITIONAL REQUIREMENTS FOR PASTA PRODUCTS

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST
(i)	Total ash (on dry basis) per cent by mass, max.	1.0	B
(ii)	Acid insoluble ash (on dry basis) per cent by mass, max.	0.05	C
(iii)	Total protein (N x 5.7) (on dry basis) per cent by mass, min.	10.5	D
(iv)	Cooking test: Total solids in gruel, per cent by mass, max.	10	E
(v)	Free fatty acids as oleic acid of extracted oil, per cent by mass, max.	0.8	F
(vi)	Crude fibre content per cent by mass, max.	0.45	G

4. Hygiene

4.1 Pasta products shall be manufactured in premises complying with the hygienic practices stipulated in the Public Health Act, Cap. 242, the Food, Drugs and Chemical substances Act, Cap. 254 of the Laws of Kenya and KS 05-1500, Code of practice for food and drink manufacturing industry.

4.2 The finished products shall be free from cracks, off-flavour, insect infestation, foreign matter and adulterants.

4.3 The level of total aflatoxin in pasta products shall not exceed 10 ppb, wherein aflatoxin B_1 shall not be more than 5 ppb when tested according to KS ISO 16050

4.4 When tested in accordance with the methods stipulated in KS 05-220*, pasta products shall be free from pathogenic organisms and shall comply with microbiological limits stipulated in Table 2.

TABLE 2. MICROBIOLOGICAL LIMITS FOR PASTA PRODUCTS

SL No	TYPE OF MICRO-ORGANISM	MAXIMUM LIMIT OF COUNTS
(i)	Total viable counts	10^4 per g
(ii)	E. Coli	Shall be absent
(iii)	Salmonella in 30 g	Shall be absent
(iv)	Yeasts and moulds	10^2 per g
(v)	*Staphylococcus aureus*	Shall be absent

5. Food additives

Only the food additives permitted for use in pasta products by the Food, Drugs and Chemicals Substances Act Cap 254 of the Laws of Kenya, CODEX STAN 195: Codex General Standard for food additives or KS 660 Guide to the safe use of food additives may be used for the intended purpose within the specified limits.

6. Packaging

6.1 The product shall be packed in food grade material that shall ensure product safety and integrity.

6.2 The fill of the package shall comply with the Weights and Measures Act, Cap. 513 of the Laws of Kenya.

7 Labelling

7.1 Labelling of dry milled maize meal products shall be done in accordance with the provisions of KS 40 In addition, the following shall be legibly and indelibly marked:

(i) Name of product.

(ii) Name, physical location and address of manufacturer.

(iii) List of ingredients.

(iv) Net contents in g or kg.

(v) Date of manufacture.

---

* Methods for the microbiological examination of foods.

(vi) Batch number.

(vii) Expiry date.

(viii) The declaration 'Made in Kenya' or country of origin for imported products.

(ix) The recommended cooking time for the pasta products.

7.2 Any Health and/or Nutrition claim on maize flour shall conform to the provisions of KS CAC/GL 23 *Guidelines for nutrition and health claims.*

APPENDIX A

DETERMINATION OF MOISTURE

A1. PROCEDURE

A1.1 Preparation of Sample — Grind in pestle and mortar about 30 g of the material so that at least 90 per cent passes through 425 micro sieve. Transfer this prepared sample to a well-stoppered glass bottle for use as indicated in **A1.2** and **D3.1**.

A1.2 Weigh accurately about 5 g of the prepared sample in a suitable moisture dish made of porcelain, silica or platinum, previously dried in an air-oven and weighed. Place the dish in an air-oven maintained at 105 ± 2℃ for five hours. Cool the d ish in a desiccator and weigh the dish with the lid on. Heat again at 105 ± 2℃ in the air-oven for 30 minutes, cooling and weighing till the difference between two successive weighings is less than one milligram. Note the lowest mass.

NOTE: Preserve the dish containing the dried material for the determination of ash (*see* **B1**).

A2. CALCULATION

$$\text{Moisture, per cent by mass} = \frac{100\,(M_1 - M_2)}{M_1 - M}$$

where,

M_1 = mass in g of the dish with the material before drying,

M = mass in g of the empty dish, and

M_2 = mass in g of the dish with the material after drying.

A P P E N D I X B

DETERMINATION OF TOTAL ASH

B1. PROCEDURE

Ignite the dried material (*see* **A1.2)** in the dish with a flame of suitable burner for about one hour till the material is completely charred. Complete the ashing by keeping in a muffle furnace at 600 ± 20℃ until grey ash results. Cool in a desiccator and weigh. Repeat the process of heating for 30 minutes, cooling and weighing till the difference in mass between two successive weighings is less than one milligram. Note the lowest mass.

NOTE: Preserve the dish containing this ash for the determination of acid insoluble ash (*see* **C2**).

B2. CALCULATION

B2.1 Total ash (on dry basis), per cent by mass = $\frac{100\,(M_2 - M)}{M_1 - M}$

where,

M_2 = mass in g of the dish with the ash,

M = mass in g of the empty dish, and

M_1 = mass in g of the dish with the dried material (*see* M_2 in **A2**).

A P P E N D I X C

DETERMINATION OF ACID INSOLUBLE ASH

C1. REAGENTS

Dilute Hydrochloric Acid — Approximately 5 N prepared by diluting concentrated hydrochloric acid with distilled water.

C2. PROCEDURE

To the ash contained in the dish (*see* **B1**) add 25 mL of dilute hydrochloric acid, cover with watch-glass and heat on water-bath for 10 minutes. Allow to cool, filter the contents from the dish through Whatman filter paper No 42 or its equivalent. Wash the filter paper until the washings are free from the acid and return it to the dish. Keep it in an air-oven maintained at 105 ± 2℃ for about three hours. With the flame of a suitable burner, complete the ashing in a muffle furnace at 600 ± 20℃ for one hour. Cool the dish in a desiccator and weigh. Heat again at 600 ± 20℃ in the muffle furnace for 30 minutes. Cool the dish in the desiccator and weigh. Repeat the process of heating for 30 minutes, cooling and weighing till the difference in mass between successive weighings is less than 1 milligram. Note the lowest mass.

C3. CALCULATION

Acid insoluble ash (on dry basis), per cent by mass $\dfrac{100\,(M_2 - M)}{M_1 - M}$

where,

M_2 = mass in g of the dish with acid insoluble ash,

M = mass in g of the empty dish, and

M_1 = mass in g of the dish with the dried material (*see* M_2 in **A2**).

APPENDIX D

DETERMINATION OF TOTAL PROTEIN

D1. APPARATUS

A recommended apparatus as assembled in Figure 1.

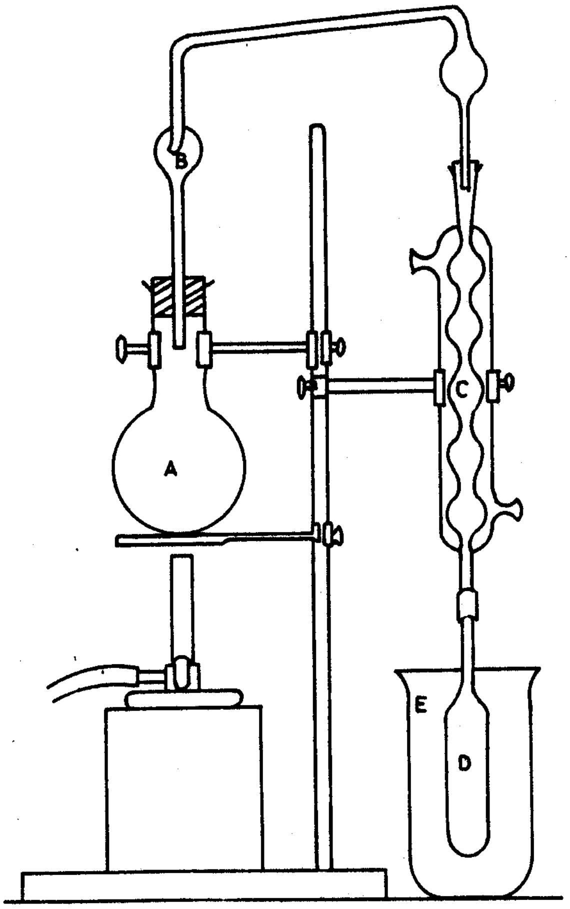

FIG. 1 – APPARATUS FOR DETERMINATION OF PROTEIN

D1.1 Description — The assembly consists of a round bottomed flask A of 100 mL capacity fitted with a rubber stopper through which passes one end of the connecting bulb tube B. The other end of the bulb is connected to the condenser C which is attached by means of a rubber tube to a dip tube D which dips into a known quantity of standard sulphuric acid contained in beaker E of 250 mL capacity.

D1.2 Kjeldahl Flask — Of capacity 500 mL.

D2. REAGENTS

D2.1 Anhydrous sodium sulphate.

D2.2 Copper sulphate.

D2.3 Concentrated sulphuric acid.

D2.4 Sodium Hydroxide Solution — Dissolve about 225 g of sodium hydroxide in 500 mL of water.

D2.5 Standard Sulphuric Acid — 0.1 N.

D2.6 Methyl Red Indicator Solution — Dissolve one gram of methyl in 200 mL of rectified spirit (95 per cent by volume).

D2.7 Standard Sodium Hydroxide Solution — 0.1 N.

D3. PROCEDURE

D3.1 Transfer carefully about one gram of the prepared sample (*see* **A1.1**), accurately weighed, to a Kjeldahl flask, taking precaution to see that particles of the material do not stick onto the neck of the flask. Add about 10 g of anhydrous sodium sulphate, about 0.2 g to 0.3 g of copper sulphate and 20 mL of concentrated sulphuric acid.

Add a few pieces of pumice stone to prevent bumping. Place the flask in an inclined position. Heat below the boiling point of the acid until frothing ceases. Increase heat until acid boils vigorously and digest for 30 minutes after the mixture becomes clear and pale green or colourless. Cool the content of the flask. Transfer quantitatively to a round bottomed flask, with distilled water, the total quantity of distilled water used being about 200 mL. Add about 50 mL of the sodium hydroxide solution (which is sufficient to make solution alkaline) carefully through the side of the flask so that it does not mix at once with the acid solution but forms 3 layers below the acid solution.

Assemble the apparatus taking care that the dip tube extends below the surface of the standard sulphuric acid contained in the beaker. Mix the contents of the flask by shaking and distill until all ammonia has passed over into the standard sulphuric acid. Shut off the burner and immediately detach the flask from the condenser. Rinse the condenser thoroughly with water into the beaker. Wash the dip tube carefully so that all traces of the condensate are transferred to the beaker. When all the washings have drained into the solution, titrate with the standard sodium hydroxide solution.

D3.2 Carry out a blank determination using all reagents in the same quantities but without the material to be tested.

D4. CALCULATION

$$\text{Total protein (on dry basis, per cent by mass)} = \frac{789\,(B - A)N}{M_1(100 - M)}$$

where,

B = volume in mL of the standard sodium hydroxide solution used to neutralize the acid in the blank determination,

A = volume in mL of the standard sodium hyroxide solution used to neutralize the excess of acid in the test with the material,

N = normality of the standard sodium hydroxide solution,

M_1 = mass in g of the prepared material taken for the test, and

M = moisture, per cent by mass of the material (*see* **A2**).

APPENDIX E

DETERMINATION OF TOTAL SOLIDS IN GRUEL

E1. APPARATUS

E1.1 **Lipless Beaker —** Tall-form, of capacity 500 mL.

E1.2 Oil Bath.

E1.3 Electric Heater.

E2. PROCEDURE

Take 250 mL water in the lipless beaker and heat over an oil bath kept at about 102℃ by electric heating. Introduce exactly 25 g of the pasta product (previously) broken into 10 mm lengths in case of long pasta products and cook at a constant temperature of about 98℃ at sea level with occasional stirring.

NOTE: The cooking time required by this appparatus is on an average two minutes more than that recommended on the package (i.e. more than that required with free boiling water). Allow the cooked pasta to drain for five minutes. Measure the volume of gruel collected. Pipette out 20 mL of the gruel, after stirring well to give an even distribution of the solid content, into a tared petri dish and evaporate to dryness on a water-bath. Transfer the petri dish and evaporate to dryness on a water-bath. Transfer the petri-dish to a hot air-oven maintained at 105 ± 2℃ and dry to constant ma ss.

E3. CALCULATION

Total solids in gruel, per cent by mass $= \frac{(M_2 - M_1)\mathrm{V}}{5}$

where,

M_2 = mass in g of petri dish with total solids per cent in 20 mL of gruel,

M_1 = mass in g of empty petri dish, and

V = volume of gruel in mL.

APPENDIX F

DEGREE OF ACIDITY OF RAW PASTA

F1. PROCEDURE

Weigh 4 g of milled raw pasta into an Erlenmeyer flask and carefully suspend 100 mL of neutralized 50 vol. per cent ethanol. Stopper the flask to avoid solvent loss and leave for one hour at room temperature. The contents should be whirled by hand four times during this period. At the end, agitate the suspensions vigorously, clear by centrifuging (3 minutes at 300 rpm) or filtration (funnel sitting directly on the neck of another Erlenmeyer flask and flute paper filter (15 cm) covered with petri dish, both measures to avoid solvent losses). The suspension shall be filtered in total and also 100 mL 50 vol. per cent neutralized ethanol shall be filtered in the same way to be used as a blank (to compensate for any absorption on the filter paper). To 50 mL of the cleared-extract and 50 mL of the filtered blank (in case of centrifuging no blank is necessary), three drops of 1 per cent phenolphthalein in ethanol are added. These aliquots are titrated with 0.1 N NaOH from a burette with 0.02 mL graduation until the first reddish tint appears and remains visible for at least 10 s (change in colour from greenish yellow to reddish yellow in sample extracts).

F2. CALCULATION

$$\text{Acidity degree (pasta dry matter)} = \frac{(n - n_o) \times 5 \times 100}{100 - m}$$

where,

n = mL 0.1 N NaOH for 50 mL extract,

n_o = mL 0.1 N for 50 mL blank, and

m = moisture content of raw pasta.

APPENDIX G

DETERMINATION OF CRUDE FIBRE CONTENT

G1. PREPARATION OF SAMPLE

Break the pasta product into small fragments with hands or in mill, and mix well. Grind 300 g to 500 g in mill until all material passes through No 20 sieve. Keep ground sample in sealed container to prevent moisture changes.

G2. REAGENTS

G2.1 Sulphuric Acid Solution — 0.255 ± 0.005 N 1.25 g H_2SO_4/100 mL. The concentration must be checked by titration.

G2.2 Sodium Hydroxide Solution — 0.313 ± 0.005 N 1.25 g NaOH/100 mL, free or nearly so from Na_2CO_3. Concentration must be checked by titration.

G2.3 Prepared Asbestos — Spread a thin layer of acid washed, medium or long fibre asbestos in an evaporation dish and heat for 16 h at 600°C in furnace. Boil for 30 minutes with 1.25 H_2SO_4, filter, wash thoroughly with water, and boil for 30 minutes with 1.25 per cent NaOH. Filter, wash once with 1.25 g per cent, H_2SO_4, wash thoroughly with water, dry and ignite for 2 h at 600°C.

Determine blank by treating 1.0 g prepared asbestos with acid and alkali. Correct crude fibre results of any blank, which should be negligible (about 1 g). Asbestos recovered from the determination may be used in subsequent determinations.

G2.4 Alcohol — 95 per cent or reagent MeOH or isopropanol.

G2.5 Antifoam Compound A — Dilute (1 + 4) with mineral spirits or pot ether, or water, dilute antifoam B emulsion (1 + 4). Do not use antifoam spray.

G2.6 Bumping Chips or Granules — Broken Alumdum crucibles or equivalent granules are satisfactory.

G3. APPARATUS

G3.1 Digestion Apparatus — With condenser to fit 600 mL beaker, and hot plate adjustable to temperature so that it will bring 200 mL water at 25°C to rolling boil in 15 ± 2 minutes.

G3.2 Ashing Dishes — Silica, vireosil 70 mm x 15 mm; or porcelain, coors, No 450, size 1 or equivalent.

G3.3 Desiccator — With efficient desiccator such as 4 to 5 mesh drierite ($CaCl_2$ is not satisfactory).

G3.4 Filtering Device — With No 200 type 304 or 316 stainless steel screen easily washed free of digested residue, use any suitable filter funnel e.g. Buchner filter funnel.

G3.5 Suction Filter — To accommodate filtering devices. Attach suction flask to trap in line with aspirator or other source of vacuum with valve to break vacuum.

G3.6 Liquid Preheater — For preheating water, 1.25 per cent H_2SO_4 and 1.25 per cent NaOH solution to boiling point of H_2O.

G4. PROCEDURE

G4.1 Extract 2 g of ground material with ether or pet ether. Transfer to a 600 mL beaker avoiding fibre contamination from paper or brush. Add about 1 g of prepared asbestos, 200 mL boiling 1.25 per cent H_2SO_4 and 1 drop diluted antifoam. (Excess antifoam may give results, use only if necessary to control foaming.) Bumping chips of granules may also be added. Place the beaker on digestion apparatus with pre-adjusted hot plate and boil for exactly 30 min rotating the beaker periodically to keep solids from adhering to sides. Remove the beaker and any suitable filter funnel.

G4.1.1 *Treatment of Residue* — Dry mat and residue for 2 h at 130 ± 2°C, cool in desiccator and weigh. Ignite for 30 min at 600 ± 15°C. Cool in a desiccator and reweigh.

G5. CALCULATION

Per cent crude fibre in ground sample

$$C = \frac{(\text{loss in weight on ignition} - \text{loss in weight of asbestos blank x 100})}{\text{Weight of sample}}$$

Report results to 0.1 per cent.

APPENDIX H

DETERMINATION OF EGG YOLK SOLIDS

H1. PREPARATION OF SAMPLE

Grind in pestle and mortar about 30 g of the material so that at least 90 per cent passes through 425 micro sieve. Transfer this prepared sample to a well-stoppered glass bottle for use.

H2. PROCEDURE

H2.1 Reflux 100 g sample in a Soxhlet apparatus using 100 cm^3 pure methanol for two hours. Decant and add a further 100 cm^3 pure methanol fractions. Evaporate to dryness. Carry out a phosphorus determination as detailed below.

H2.2 Phosphorus Determination

Weigh 0.05 g of sample into a platinum dish. Add 5 cm^3 of analytical grade chloroform. Add 8 cm^3 of 4 per cent alcoholic potash and evaporate to dryness in an oven held at 105°C. Char using an Argand burner and then ash at dull red heat in a muffle furnace. When the dish has cooled, add 5 cm^3 concentrated hydrochloric acid and evaporate to dryness. Extract the residue with 10 cm^3 mL hydrochloric acid. Filter through a Whatman No 54 grade filter paper into a 100 cm^3 graduated flask. Wash any residue well with hot distilled water. Neutralize with normal sodium hydroxide using phenolphthalein as indicator. Make to the mark with distilled water.

Take a sufficient volume, by pipette, of the prepared solution containing 5 to 5 mg phosphorus and transfer to a stout boiling tube.

The total volume should be 5 cm^3, if lower than this add distilled water. Add, by fast running pipette, 1 cm^3 10 M sulphuric acid 1 cm^3 2.5 per cent ammonium molybdate and 1 cm^3 20 per cent potassium iodide solution (containing 0.5 per cent sodium carbonate). Swirl stopper with a glass ball and hold in a boiling water bath for fifteen minutes. Remove and cool in an ice bath.

Add sufficient freshly prepared 0.5 per cent sodium sulphate to remove the iodine colour and to give a light excess. Transfer the solution and make up to 50 cm^3 in a graduated flask (or smaller volume if found necessary). Measure the colour strength of the solution when held in a 1 cm glass cell using 14 and 608 filters on the Spekker absorptiometer. Carry out a check on the absorptionmeter using distilled water in the cell. Calculate the phosphorus content by reference to the reference curve for a standard phosphorus solution.

This solution can be prepared by dissolving 4.388 g analytical grade potassium dihydrogen phosphate in distilled water, adding 2 cm^3 in graduated flask. The solution contains 1 000 µg phosphorus/cm^3, lower concentrations can be obtained by dilution. For comparison purposes, in a series of tests 1 µg phosphorus/cm^3 gave a Spekker absorptiometer of 0.285.

H3. CALCULATION

Egg yolk solids = P_2O_5 x 56